



# APPROVAL SHEET

Customer Name	:	
Customer P/N	:	
Frequency	:	32.768000 KHz
Aker Approved P/N	:	D21N-032768-2-AL-00
Aker MPN	:	D21N-032768-2-AL-00
REVISION	:	A0
ISSUED DATE	:	2022/8/25

APPROVED	CHECKED	PREPARED
		
APPROVED BY CUSTOMER		

**AKER TECHNOLOGY CO., LTD.**

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**MSL:Level 1**

**RoHS compliant**



Aker Approved P/N : D21N-032768-2-AL-00		
APPROVED	: Earnest	SHEET : 1 of 4
PREPARED	: Kiku	REV . : A0
Confidential		

Rev.	Date	Reviser	Revise contents
A0	2022/8/25	Kiku	Initial Released

\*Please kindly be noted that AKER DO NOT guarantee parts quality which involves human security application.\*

## TUNING FORK CRYSTAL SPECIFICATION

### 1. ELECTRICAL CHARACTERISTICS

#### [1] Maximum Rating

	Item	Symbol	Rating	Note
1	Storage temperature range	T <sub>stg</sub>	-55~+125°C	
2	Maximum drive level	DL max.	1.0 $\mu$ W max.	

#### [2] Recommended Operating Condition

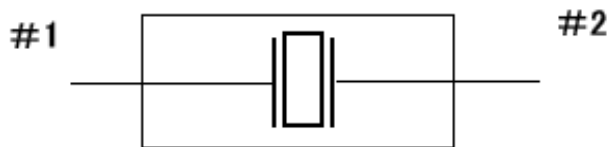
	Item	Symbol	Rating	Note
1	Operating temperature range	T <sub>use</sub>	-40~+85°C	
2	Drive level	DL	0.1 $\mu$ W typ.	

#### [3] Electrical-characteristics

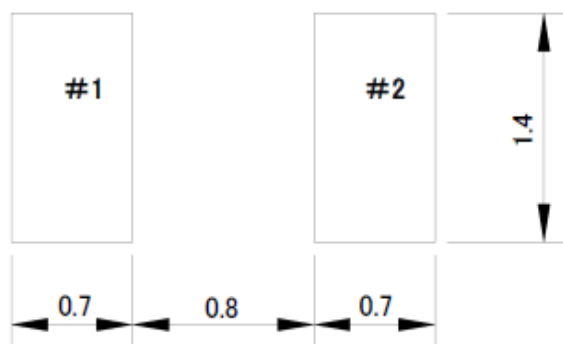
Measurement temperature: 25 $\pm$ 2°C

	Item	Symbol	Specification	Condition
1	Nominal frequency	f <sub>nom</sub>	32.768 kHz	
2	Frequency tolerance	f <sub>tol</sub>	$\pm 20 \times 10^{-6}$	
3	Load capacitance	C <sub>L</sub>	12.5pF	
4	Motional resistance	R <sub>1</sub>	70 k $\Omega$ max.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
5	Motional capacitance	C <sub>1</sub>	6 fF typ.	
6	Shunt capacitance	C <sub>0</sub>	1.3 pF typ.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
7	Turnover temperature	T <sub>i</sub>	25 $\pm$ 5°C	Measure this coefficient at 5 points of -40°C、-20°C、25°C、60°C、85°C
8	Parabolic coefficient	B	$(-0.03 \pm 10\%) \times 10^{-6}/^{\circ}\text{C}^2$	using C-MOS circuit.
9	Frequency aging	f <sub>age</sub>	$\pm 3 \times 10^{-6}$ /year	25 $\pm$ 3°C, First year
10	Insulation resistance	IR	500 M $\Omega$ min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V

## 2 . INTERNAL CONNECTION:

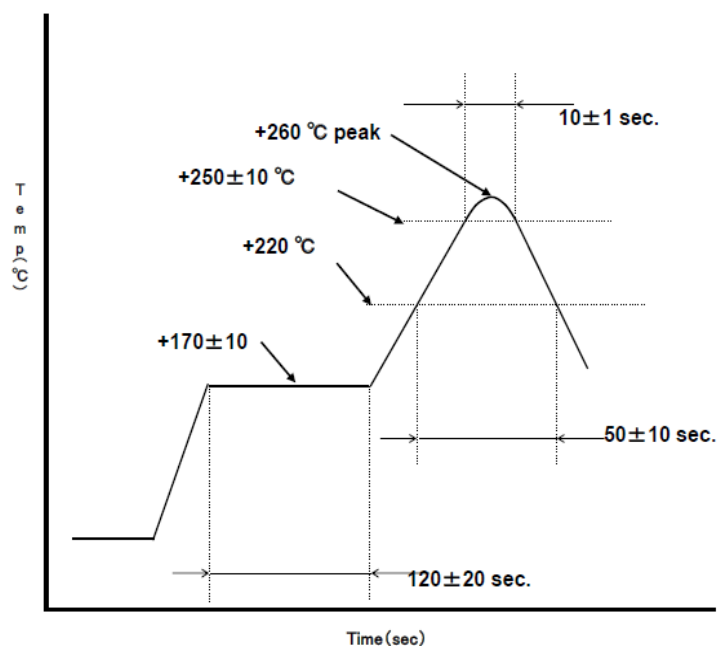


## 3 . RECOMMENDED SOLDERING PATTERN:( Unit : mm )

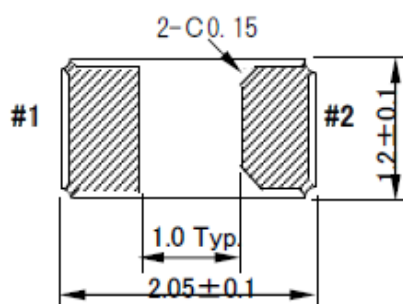
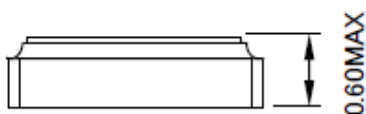
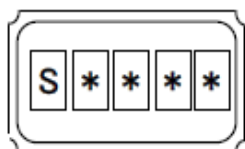


## 4. SOLDERING REFLOW PROFILE :

Pre-heating temperature : +170°C      Pre-heating time : 120sec  
Heating temperature : +220°C      Heating time : 50sec



## 5 . DIMENSIONS : ( Unit : mm )



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\*1 \*2 \*3 \*4 \*5

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- \*1 Specification
- \*2 CL (7pF: B, 9pF: J, 12.5pF: F )
- \*3 Year of Production (Last Digit of Year)
- \*4, 5 Week of Production (01 ~ 52)